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Case Report

A Rare Complication Following Transarterial Chemoembolization for Hepatocellular Carcinoma

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Abstract.

According to the Taiwanese government's official annual report listing the top 10 causes of death, cancer was the leading cause of death in Taiwan in 2013, with hepatocellular carcinoma ranking second among those cancer deaths. Transarterial chemoembolization has been shown to be widely used in the treatment for unresectable disease, and increase survival in patients with intermediate stage hepatocellular carcinoma according to the Barcelona Clinic Liver Cancer classification. Despite relatively low morbidity, however, major complications may be seen. We report the case of a 54-year-old male with hepatocellular carcinoma who suffered from severe abdominal pain after transarterial chemoembolization, where further studies found a rare complication of subcapsular hematoma of the right kidney.

Keywords **:** hepatic artery chemoembolization, hepatocellular carcinoma, complications

病例報告

肝動脈化療栓塞治療肝癌的罕見併發症

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中文摘要

根據 2013 年台灣年度十大死因報告，癌症仍然佔首位，其中肝癌是第二常見的癌症死因。肝動脈化療栓塞已廣泛用於治療不能手術切除的肝癌和提升巴塞隆納肝癌分類為中期患者的存活率。儘管肝動脈化療栓塞併發症不高，嚴重的併發症仍會發生。我們報告一位 54 歲肝癌患者在做完肝動脈化療栓塞後有嚴重腹痛，之後檢查發現右腎包膜下血腫之罕見併發症。

關鍵字**:** 肝動脈化療栓塞治療、肝細胞癌、併發症

INTRODUCTION

Cancer was the leading cause of death in Taiwan in 2013, according to the official annual report issued by the Taiwan Department of Health. In particular, hepatocellular carcinoma (HCC) was the second leading cause among those cancer deaths [1]. Compared with the frequently limited options for other cancers, treatment selection for HCC is variable, such as surgery, percutaneous ethanol injection, radiofrequency ablation, and transarterial chemoembolization (TACE).

Such options exist in part because patient prognosis depends not only on the tumor extent but also hepatic function reserve [2,3]. TACE is now widely used for the treatment of HCC in Taiwan. Major complications in the technique of TACE occur in 5% of patients, with a 1% risk of death [4]. Various complications associated with TACE for HCC include hepatic failure, hepatic infarction, liver abscess, bilomas, cholecystitis, gastrointestinal mucosal lesions, and multiple intrahepatic aneurysms [5].

The most common vascular complication related to arterial access is hepatic artery injury [4]. Here, we report the case of a 54-year-old male with hepatocellular carcinoma who suffered from severe right abdominal pain after TACE. Additional investigation revealed a rare complication of subcapsular hematoma of the right kidney.

CASE REPORT

A 54-year-old male with a past history of chronic hepatitis B and hepatocellular carcinoma was diagnosed 3 years ago after S6 partial hepatectomy. He didn't receive antiviral treatment for chronic hepatitis B (HBe Ag: negative, HBV DNA: 525 IU/mL). A 3.5 cm target-like mass in S7 was found by abdominal ultrasonography prior to admission during regular follow-up. Dynamic abdominal computed tomography (CT) showed a 4.1 cm hypervascular mass with washout of contrast enhancement. With a presumptive diagnosis of recurrent hepatocellular carcinoma, the patient received TACE by superselective catheterization of the feeding artery from the right hepatic artery and therapeutic chemo-embolization with 40 mg Doxorubicin mixed with 10 ml Lipiodol, 1.0 gm Cefazolin, and gelfoam piece as embolizers.

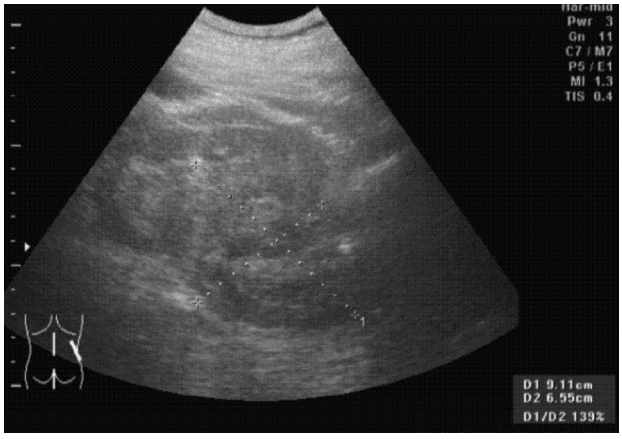

Figure 1. Ultrasonography. A heterogenous echogenic mass was found in the right kidney, 9.1x6.5 cm in size

After TACE, the patient suffered from severe right flank pain and right upper quadrant pain. His hemodynamic status was stable. Laboratory data revealed deteriorate liver function, including GOT/GPT level (44/33 to 142/142 IU/L; normal range: 15-41/14-40 IU/L), and total/direct bilirubin level (2.6/0.6 to 4.5/0.8 mg/dL). The patient's hemoglobin level decreased rapidly (9.9 to 5.9 g/dL) in 2 days and presented with acute kidney injury (creatinine levels: 0.6 to 1.6 mg/dL). Follow-up ultrasonography showed a huge heterogenous mass in the right kidney (Figure 1). When the patient was administered a whole abdominal CT scan without contrast, retention of contrast medium in the right kidney and hyperdense lesion in the right subcapsular and perirenal space was noted, compatible with internal bleeding (Figure 2A). There was a large area of lipiodol collection in the liver presenting HCC post TAE (Figure 2B).

The patient was treated conservatively with blood transfusion and intravenous volume replacement. A protruding soft mass lesion in the right flank then ecchymosis over right flank was noted on day 7 post TACE. The hematoma had decreased when a follow-up ultrasonography was obtained 10 days after the procedure. He was discharged uneventfully on day

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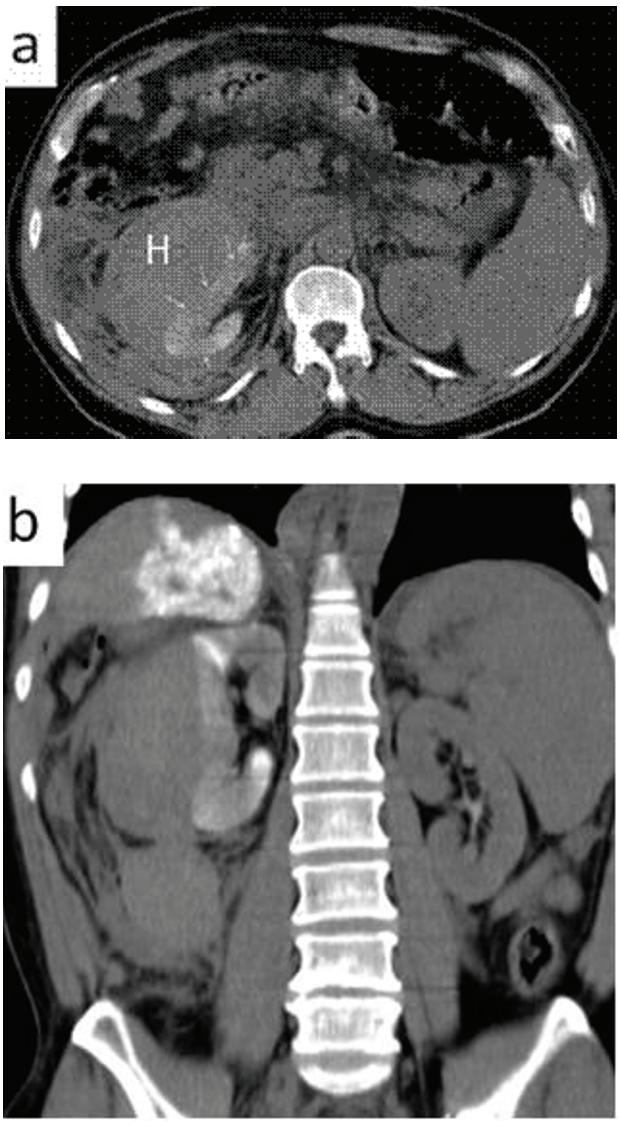

Figure 2. Abdominal CT scan without contrast enhancement. (A) Retention of contrast medium was found in the right kidney (arrow). There was evidence of subcapsular and peri-renal area hematoma (H). (B) A large area of lipiodol was collected in S7 segment of liver presenting lipiodol TACE for management of HCC

12. Follow-up with abdominal CT revealed resolution large subcapsular hematoma of the right kidney 1 month later (Figure 3).

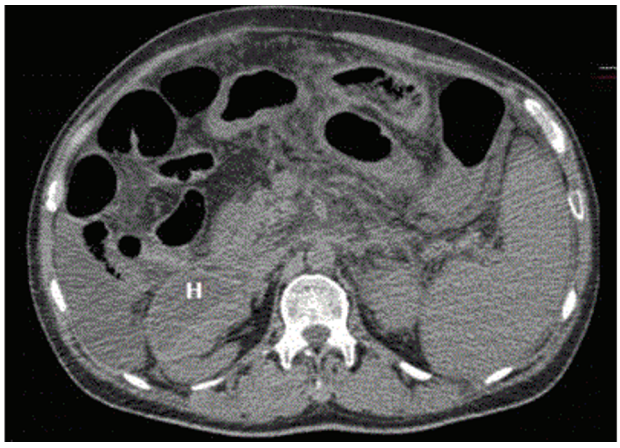

Figure 3. Abdominal CT scan without contrast enhancement. Resolution of subcapsular hematoma (H) in the right kidney was found 1 month later

DISCUSSION

Transarterial chemoembolization is the most widely performed treatment for patients with HCC who are not eligible for curative surgery or ablation. The survival benefit and efficacy of TACE has been also confirmed by numerous randomized controlled trials and meta-analysis [6-8]. The procedure involves gaining percutaneous transarterial access to the hepatic artery with an arterial sheath, usually by puncturing the common femoral artery in the right groin and passing a catheter guided by a wire via the abdominal aorta, through the celiac trunk and common hepatic artery, and finally into the proper branch of the hepatic artery which supplies the tumor.

However, a variety of complications related to the chemoembolic agents and to manipulation guide wire may occur during or after TACE. These complications can be classified into two major categories: vascular and nonvascular cause.

Vascular complications of TACE include puncture site complications, injury to the hepatic artery itself and non-target embolization. Other complications, such as arterial rupture and acute thrombosis, are more serious and may result in blood loss or otherwise

threaten the patient's life. Non-vascular complications of TACE include post TACE syndrome (occurs in around 90% of patients) [4], infection, biliary stricture, GI bleeding, hepatic failure and renal failure.

The most common vascular complication related to arterial access is hepatic artery injury [4], which leads to hepatic artery spasm and inflammatory constriction, and severe cases may even lead to occlusion, dissection, intrahepatic and extrahepatic collateralization, and aneurysm formation in the hepatic artery [9]. The incidence of significant hepatic artery damage was 16% per artery and 48% per patient [9].

When a catheter is being advanced against resistance, the celiac artery or gastroduodenal artery may cause iatrogenic dissection and guide wire-induced perforation. The renal artery injury complications are mostly from renal artery angioplasty or stent dilatation procedures [10]. The incidence of serious iatrogenic injuries of the renal artery after percutaneous revascularization procedures is not rare, having been calculated by researchers in early series to occur in 6.5-22.8% of patients undergoing angioplasty [11,12]. Many of these complications may be recognized immediately, but presentations of some complications can be delayed [13].

We noted that the guide wire tip was in the right renal artery before it got into the hepatic artery in this patient. This guidewire tip may have been in a wrong position and therefore caused perforation of an intrarenal branch artery. This injury was not recognized during the procedure and caused retention of contrast in the right kidney during contrast injection. Owing to no obvious hemodynamic change, we did not perform a second angiogram on this patient. However, if any sign of persistent hemorrhage or hemodynamic instability had been evident, a second angiogram and a possible transcatheter embolization procedure should be performed immediately.

In most cases of traumatic renal artery rupture or pseudoaneurysm, they are usually mild and can be cured spontaneously with conservative treatment [14]. However, surgical intervention is often necessary in patients whose perirenal hemorrhage extends progressively, and whose hemodynamics remain unstable despite aggressive anti-shock treatment [15]. With advances in intervention technology in recent years, percutaneous renal artery embolization has become an alternative to surgery for the treatment of uncontrolled iatrogenic arterial kidney injuries because the procedure is minimally invasive, with a shorter duration of hospitalization required. Furthermore, it is safe and associated with high technical and clinical success rates and not associated with a significant worsening of renal function [16].

CONCLUSIONS

Transarterial chemoembolization has been widely used to treat patients with hepatocellular carcinoma. As with any other interventional procedure, there is a small risk of hemorrhage and/or damage to blood vessels. To avoid arterial perforation, physicians should be careful to wedge the guide wire during selective catheterization and be familiar with the procedure's potential side effects. Thereafter, post-surgical follow-up on any noted clinical symptoms should be timely, where ultrasonographic testing can be important to best evaluate any complication of TACE.

REFERENCES

1. 行政院衛生署衛生福利部國民健康署：102 年國人主要死因統計。
2. Takayasu K, Arii S, Ikai I, et al. Liver Cancer Study Group of Japan. Prospective cohort study of transarterial chemoembolization for unresectable hepatocellular carcinoma in 8510 patients. **Gastroenterology 131:** 461-69, 2006.
3. Llovet JM, Bruix J. Systematic review of randomized trials for unresectable hepatocellular carcinoma: chemoembolization improves survival. **Hepatology 37:** 429-42, 2003.
4. Sueyoshi E, Hayashida T, Sakamoto I, et al. Vascular complications of hepatic artery after

transcatheter arterial chemoembolization in patients with hepatocellular carcinoma. **AJR Am J Roentgenol 195:** 245-51, 2010.

5. Sakamoto I, Aso N, Nagaoki K, et al. Complications associated with transcatheter arterial embolization for hepatic tumors. **Radiographics 18:** 605-19,1998.
6. Lo CM, Ngan H, Tso WK, et al. Randomized controlled trial of transarterial Lipiodol chemoembolization for unresectable hepatocellular carcinoma. **Hepatology 35:** 1164-74, 2002.
7. Camma C, Schepis F, Orlando A, et al. Transarterial chemoembolization for unresectable hepatocellular carcinoma: meta-analysis of randomized controlled trials. **Radiology 224:** 47-54, 2002.
8. Llovet JM, Bruix J. Systematic review of randomized trials for unresectable hepatocellular carcinoma: chemoembolization improves survival. **Hepatology 37:** 429-42, 2003.
9. Maeda N, Osuga K, Mikami K, et al. Angiographic evaluation of hepatic arterial damage after transarterial chemoembolization for hepatocellular carcinoma. **Radiat Med 26:** 206-12, 2008.
10. Morris CS, Bonnevie GJ, Najarian KE. Nonsurgical treatment of acute iatrogenic renal artery injuries occurring after renal artery angioplasty and stenting. **AJR Am J Roentgenol 177:** 1353-357, 2001.
11. Martin LG, Casarella WJ, Alspaugh JP, et al. Renal artery angioplasty: increased technical success and decreased complications in the second 100 patients. **Radiology 189:** 631-34, 1986.
12. Bergqvist D, Jonsson K, Weibull H. Complications after percutaneous transluminal angioplasty of peripheral and renal arteries. **Acta Radiol 28:** 3-12, 1987.
13. Puijlaert CB, Mali WP, Rosenbusch G, et al. Delayed rupture of renal artery after renal percutaneous transluminal angioplasty. **Radiology 159:** 635-37, 1986.
14. Santucci RA, Wessells H, Bartsch G, et al. Evaluation and management of renal injuries: consensus statement of the renal trauma subcommittee. **BJU Int 93:** 937-54, 2004.
15. McAninch JW, Carroll PR, Klosterman PW, et al. Renal reconstruction after injury. **J Urol 145:** 932-37, 1991.
16. Sam K, Gahide, G, Soulez G., et al. Percutaneous embolization of iatrogenic arterial kidney injuries: safety, efficacy, and impact on blood pressure and renal function. **J Vasc Interv Radiol 22:** 1563-568, 2011.